

A Report on the City of Hyattsville's Existing and Possible Urban Tree Canopy

Summary

An analysis of Hyattsville's urban tree canopy (UTC) based on high resolution aerial imagery found that 700 acres of the city is covered by tree canopy (termed Existing UTC). This corresponds to 41% of Hyattsville's land area (land area refers to all areas not occupied by water). An additional 41% (698 acres) of the city could theoretically be improved to support urban tree canopy (termed Possible UTC), although the amount of land where it is desirable to plant trees is less.

The majority of Hyattsville's Existing UTC (21% of all tree canopy, 356 acres) is located in areas where the land use is designated as "housing." Land in the rights-of-way (ROW) contains most of the Possible UTC (29% of all the possible, 86 acres).

Given the relatively high amount of tree canopy in Hyattsville, a strategy is recommended that maximizes protection and maintenance in combination with new plantings and natural regeneration. The city should consider setting a UTC goal and focus on reallocating public agency resources (funds, staff, etc.) to maintain its tree canopy. UTC maintenance will be easiest to make on government and institutional lands. On private lands, a combination of education and outreach, landowner and redevelopment incentives, and refocusing of regulatory mechanisms will help ensure that Hyattsville's tree canopy is maintained for future generations.

Project Background

The analysis of Hyattsville's urban tree canopy (UTC) was carried out at the request of the Maryland Department of Natural Resources. The analysis was performed by the Spatial Analysis Laboratory (SAL) of the University of Vermont's Rubenstein School of the Environment and Natural Resources in consultation with the USDA Forest Service's Northern Research Station

The goal of the project was to apply the USDA Forest Service's UTC assessment protocols to the City of Hyattsville. The UTC assessment protocols make use of high resolution geospatial datasets (aerial imagery, property boundaries), enabling UTC metrics to be computed at the parcel level. UTC metrics provide detailed information on a community's urban forest, and form the basis for UTC goal setting.

This project sought to leverage existing investments in geospatial data made by the city, enabling the analysis to be completed at a reasonable cost.

High Resolution Land Cover

Readily available land cover datasets lack both the detail and accuracy to effectively map tree canopy in urban areas. The National Land Cover Dataset's (NLCD) tree canopy layer is very valuable for regional analysis but with a relatively coarse resolution (30 meters) it fails to capture all of the tree canopy in Hyattsville's urban forest (Figure 1). NLCD 2001 estimates put the city's tree canopy at 13%. The 41% estimate presented in this report was derived using high resolution (1 meter) imagery acquired in 2007 as part of the National Agriculture Imagery Program (NAIP). State of the art image processing routines were used to automated the development of a high resolution land cover dataset (Figure 1).

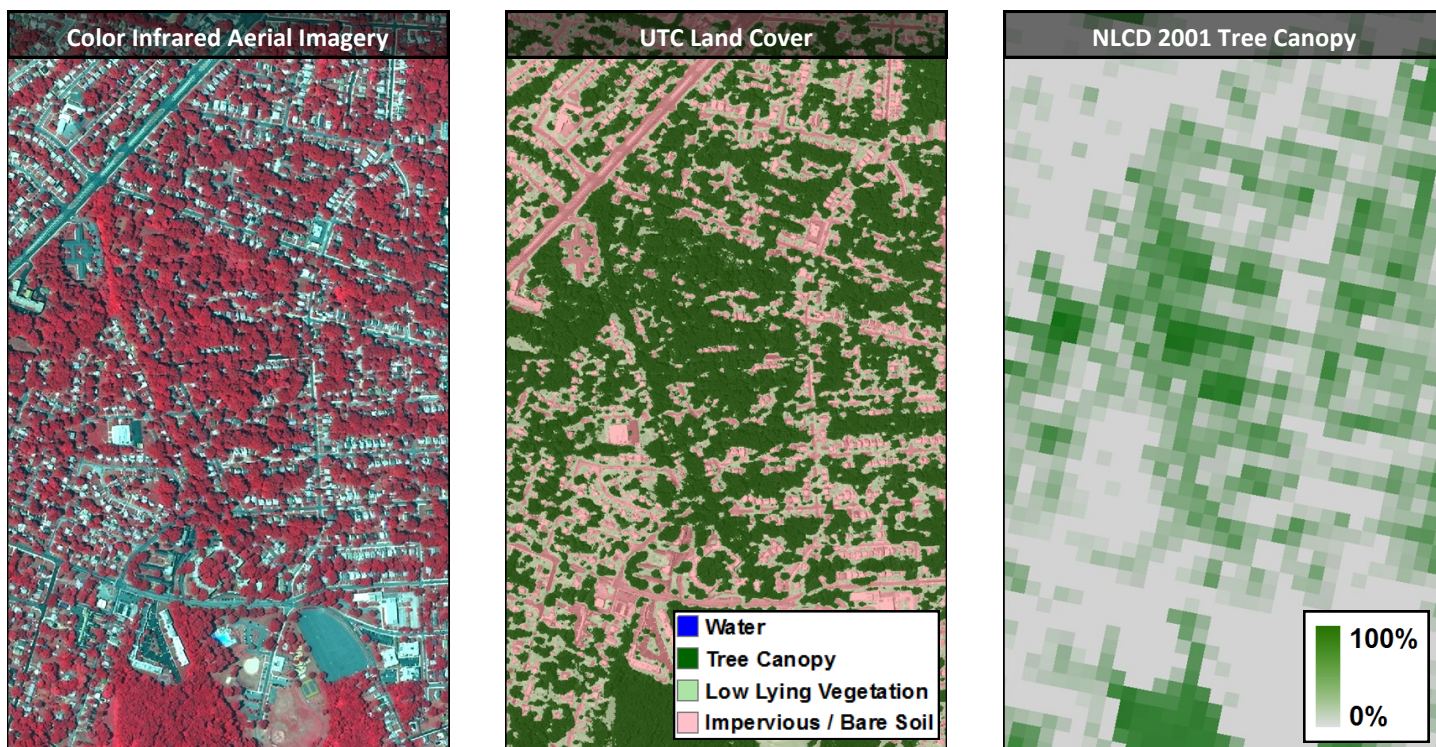


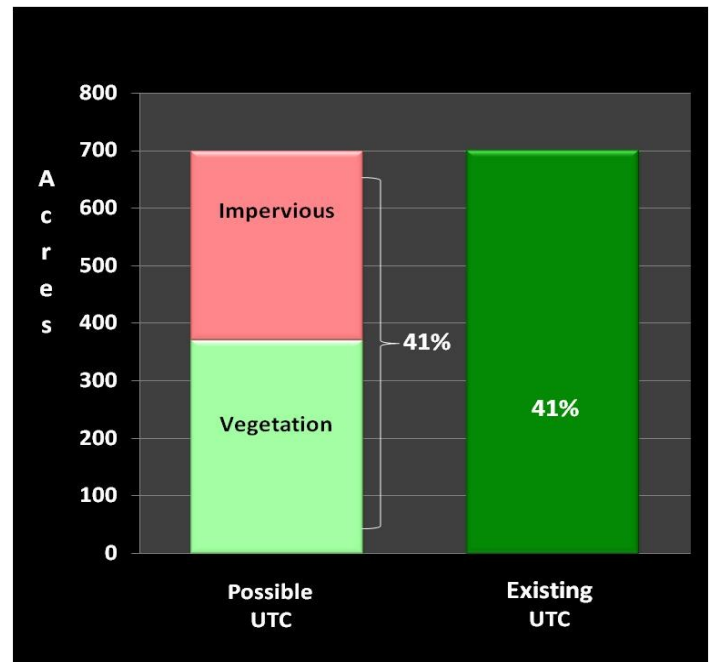
Figure 1: Comparison of the high resolution land cover dataset developed as part of this project to the National Land Cover Dataset (NLCD).

Existing and Possible UTC

UTC metrics for the City of Hyattsville were computed using the UTC assessment protocols. The UTC protocols integrate the land cover layer with existing GIS data layers from the city's GIS database.

Existing UTC was computed by simply summarizing all features identified as "tree canopy." Two types of Possible UTC were computed: Vegetated Possible UTC and Impervious Possible UTC. Vegetated Possible UTC was computed by finding all areas in the land cover dataset identified as "low lying vegetation." Impervious Possible UTC was computed by summarizing all land cover in the "impervious/bare soil" category, excluding roadways and buildings. Those areas that did not fall into either the Existing UTC or Possible UTC categories were classified as "not suitable." Not suitable areas consist of buildings, roads, and water.

Figure 2: UTC city-wide metrics. Percentages are based on % of land area in the city. Possible UTC is land where it is biophysically feasible to establish tree canopy. Possible UTC excludes structures, roads, and water; it is divided into two subcategories: impervious and vegetation.



City UTC Metrics

- Hyattsville is estimated to have 41% (700 acres) of its land area covered by tree canopy (Existing UTC)
- It would be biophysically feasible to establish tree canopy on another 41% (698 acres) of the city's land (Possible UTC).
- 19% (327 acres) of the city is Impervious Possible UTC and another 21.7% is Vegetated Possible UTC. Establishing tree canopy on the Vegetated Possible UTC, which consists of grass and shrubby areas will be much easier. Establishing tree canopy on Impervious UTC will have a greater impact on water quality.
- Within the designated "critical areas" the Existing UTC percentage is 45%, slightly higher than the city average.
- The City's five parks have high amounts of tree canopy, ranging from 47% to 99% coverage.
- Across the city's five wards, Ward 2 has the highest percentage of tree canopy (58%), Ward 4 the least (31%).

Parcel & Land Use Summary

Following the computation of the Existing and Possible UTC the UTC metrics were summarized for each property in the city's parcel database (Figure 3). For each parcel the absolute area of Existing and Possible UTC was computed along with the percent of Existing UTC and Possible UTC (UTC area / area of the parcel).

An updated land use layer was generated using the city's parcel's layer in combination with the 2007 aerial imagery. This land use layer was used to summarize UTC by land use category (Figure 4). Table 1 presents a more detailed summary of the UTC land use metrics. For each land use category UTC metrics were computed as a percentage of all land in the city (% Land), as a percent of land area by zoning land use category (% Category) and as a percent of the area for the UTC type (% UTC Type). For example, land designated as "housing" has the most Existing UTC in raw acreage (21% by % Land), but in terms of the percent of the land use type occupied by tree canopy, land designated for "culture and recreation" (64% by % Category) has the most (Table 1).

Figure 3: Parcel-based UTC metrics. UTC metrics are generated at the parcel level, allowing each property to be evaluated with respect to its Existing UTC and Possible UTC.



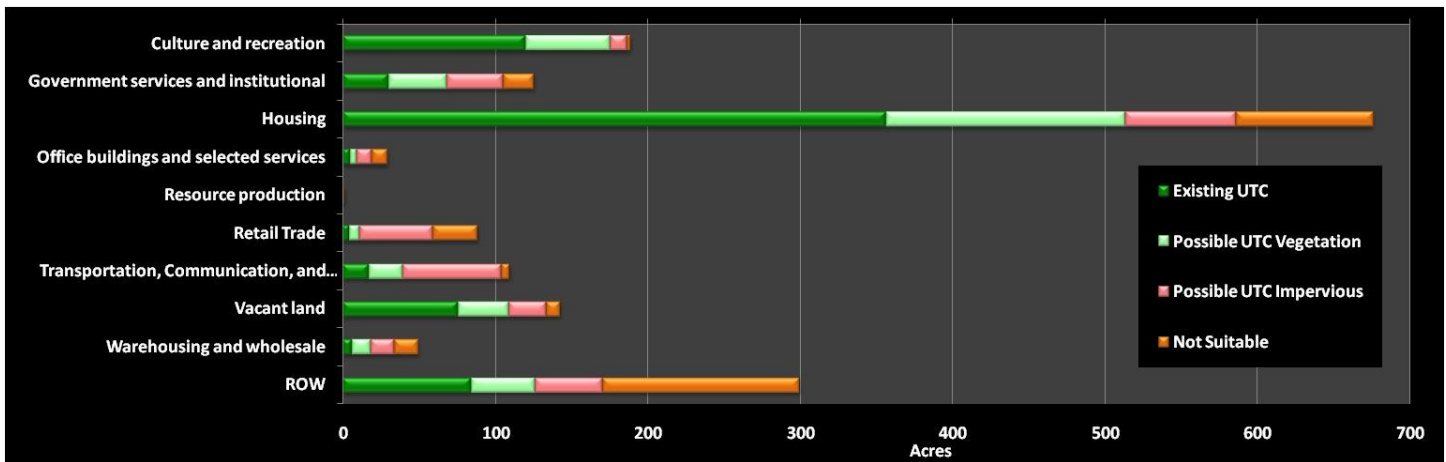


Figure 4: UTC metrics summarized by land use. Land use was determined for parcel using 2007 aerial imagery.

Land Use	Existing UTC			Possible UTC Vegetation			Possible UTC Impervious		
	% Land	% Category	% UTC Type	% Land	% Category	% UTC Type	% Land	% Category	% UTC Type
Culture and recreation	7%	64%	17%	3%	29%	15%	1%	6%	3%
Government services and institutional	2%	24%	4%	2%	31%	10%	2%	29%	10%
Housing	21%	53%	51%	9%	23%	42%	4%	11%	20%
Office buildings and selected services	0%	17%	1%	0%	14%	1%	1%	32%	3%
Resource production	0%	31%	0%	0%	13%	0%	0%	43%	0%
Retail Trade	0%	5%	1%	0%	8%	2%	3%	54%	13%
Transportation, Communication, and utilities	1%	16%	2%	1%	20%	6%	4%	58%	17%
Vacant land	4%	53%	11%	2%	23%	9%	1%	17%	7%
Warehousing and wholesale	0%	12%	1%	1%	25%	3%	1%	31%	4%
ROW	5%	28%	12%	2%	14%	11%	3%	15%	12%

% Land = $\frac{\text{Area of UTC type for specified land use}}{\text{Area of all land}}$

% Category = $\frac{\text{Area of UTC type for specified land use}}{\text{Area of all land for specified land use}}$

% UTC Type = $\frac{\text{Area of UTC type for specified land use}}{\text{Area of all UTC type}}$

The % Land Area value of 21% indicates that 21% of Hyattsville's land area is tree canopy in areas where the land use is "housing."

The % Land Use value of 53% indicates that 53% of "housing" land is covered by tree canopy.

The % UTC Type value of 51% indicates that 51% of all Existing UTC lies in areas of "housing" land use.

Table 1: UTC metrics by type, summarized by land use. For each land use category UTC metrics were computed as a percent of all land in the city (% Land), as a percent of land area by land use category (% Category) and as a percent of the area for the UTC type (% UTC Type).

Decision Support

The parcel-based UTC metrics were integrated into the city's existing GIS database. Decision makers can use GIS to find out specific UTC metrics for a parcel or set of parcels. This information can be used to estimate the amount of tree loss in a planned development or set UTC improvement goals for an individual property.

Field	Value
Parcel ID	2819
Land Use	Govt./Inst.
Legal Square Footage	40,348
Existing UTC Area	9311
Existing UTC Percent	23%
Possible UTC Area	24,768
Possible UTC Percent	95
Possible UTC Vegetation Percent	61%
Possible UTC Impervious Percent	40%

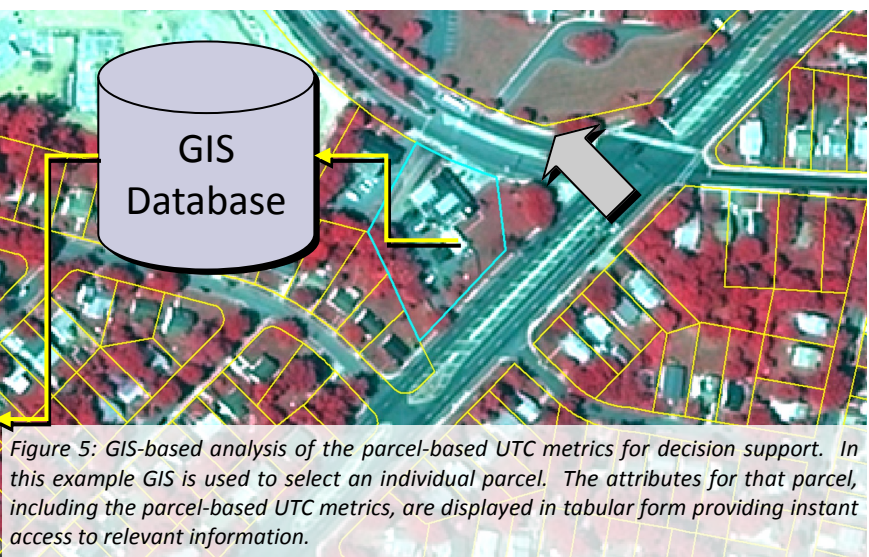


Figure 5: GIS-based analysis of the parcel-based UTC metrics for decision support. In this example GIS is used to select an individual parcel. The attributes for that parcel, including the parcel-based UTC metrics, are displayed in tabular form providing instant access to relevant information.

Conclusions

- Hyattsville's urban tree canopy is a vital city asset; reducing stormwater runoff, improving air quality, reducing the city's carbon footprint, enhancing quality of life, contributing to savings on energy bills, and serving as habitat for wildlife.
- Occupying 41% of the city's land area, Hyattsville clearly has above average tree canopy, both in the state of Maryland and in comparison to cities of similar size.
- Given the city's relatively high amount of tree canopy the city's chief challenge will be preserving its trees and forests for future generations through maintenance and regeneration.
- From a UTC standpoint the city is very similar to Annapolis. Annapolis committed to achieving a goal of 50% tree canopy by 2036. A similar goal is feasible for Hyattsville.
- With Existing UTC and Possible UTC summarized at the parcel level and integrated with the City's GIS database, individual parcels and subdivisions can be examined and targeted for UTC improvement.
- Of particular focus for UTC improvement should be parcels within the city that have large contiguous impervious surfaces. These parcels contribute high amounts of runoff, degrading water quality. The establishment of tree canopy on these parcels will help to reduce runoff during periods of peak overland flow.
- By ownership type, it is Hyattsville's residents that control the largest percentage of the city's tree canopy. Programs that educate residents on tree stewardship and incentives provided to residents that plant trees are crucial if Hyattsville is going to sustain its tree canopy in the long term.
- Increases in UTC will be most easily achieved on vacant and land in the rights-of-way. These land uses have a relatively high percentage of Possible UTC and these are lands where the government can most readily implement policy.
- Parcels where the land use is "retail trade" have a disproportionately low amount of their land covered by tree canopy (5%). Incentive or regulatory measures should be employed to encourage retailers to increase tree canopy on their property. This will improve water quality, and according to one study, improve business.
- The city's parks have the majority of their land covered by tree canopy, but localized improvements could be made, specifically in the establishment of riparian buffers.
- Within the rights-of-way a "greenstreets" initiative could be employed to convert impervious traffic islands and medians into vegetated spaces.

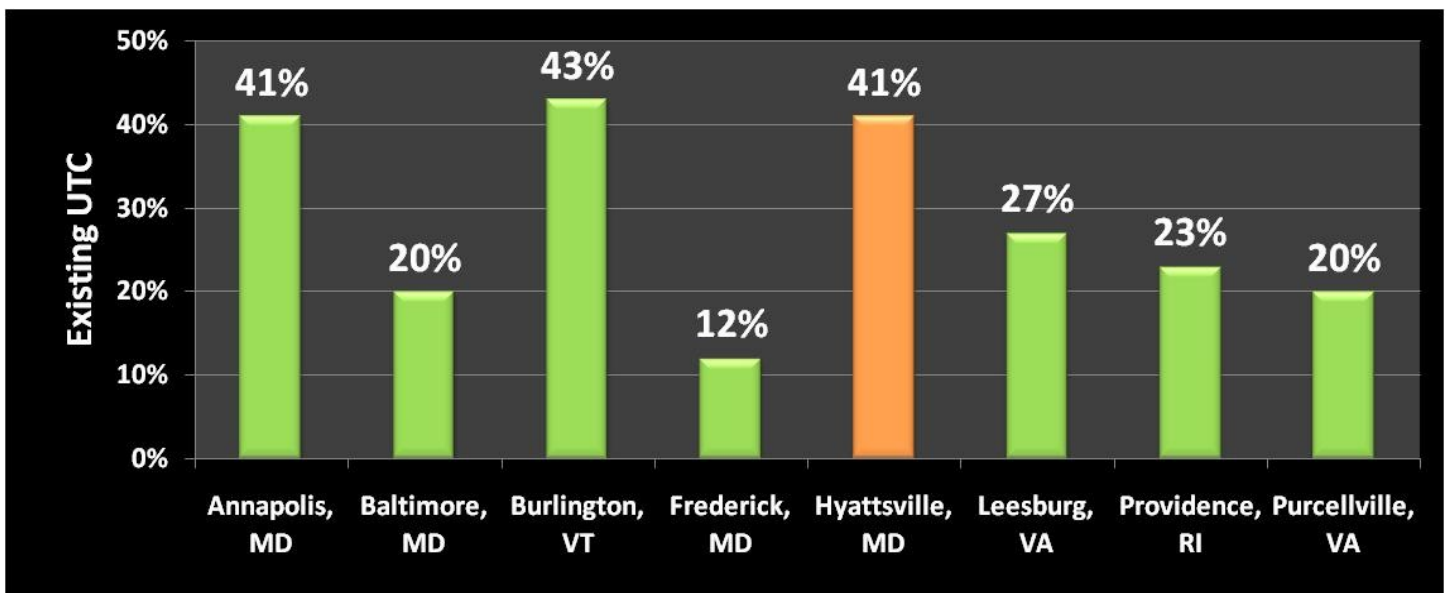


Figure 6: Comparison of Existing UTC with other selected cities that have completed UTC assessments.

Prepared for:

Jim Chandler
Community Development Manager
City of Hyattsville
4310 Gallatin Street
Hyattsville, MD 20781
P: (301) 985-5000

Prepared by:

Jarlath O'Neil-Dunne
Geospatial Analyst
Spatial Analysis Laboratory
Rubenstein School of the Environment &
Natural Resources
University of Vermont
joneildu@uvm.edu
802.656.3324

